September 28, 2012

Mr. Paul Gotthold
U.S. Environmental Protection Agency
1650 Arch Street
WCMD 3WC 22
Philadelphia, PA 19103

Re: Development of Site-Specific Soil and Groundwater Criteria for Sunoco Marcus Hook and Philadelphia Refineries

Dear Mr. Gotthold:

Sunoco, Inc. (R&M) (Sunoco) is submitting this letter in response to the United States Environmental Protection Agency's (EPA) letter dated April 19, 2012 regarding the Current Conditions Report and Comprehensive Remedial Plan for the Sunoco Marcus Hook Refinery. In the April 19 letter the EPA requested that Sunoco prepare a separate assessment to address four compounds of concern (COC) in soil and two COCs in groundwater. These compounds were identified because EPA believes the PADEP statewide health standards fall outside EPA Corrective Action's acceptable risk based range or because EPA doesn't have published screening levels for comparison. These COCs are:

> Soil: Benzo(g,h,i)perylene, Ethylbenzene, Naphthalene, and Phenanthrene.
> Groundwater: Naphthalene and Phenanthrene.

Based upon EPA's request, Langan compiled the available and applicable standards for the compounds listed above and presented the standards to EPA during a meeting on Tuesday, September 4, 2012. Following discussions, EPA conditionally approved Sunoco's proposed approach but requested this letter detailing the calculations and variables used to derive the proposed standards before issuing final approval. This information is discussed [by medium] in the sections below.

Soil

The generic [non-residential or worker] soil screening levels provided by the PADEP, DNREC, and EPA Region 3 (EPA) were compiled for Benzo(g,h,i)perylene, Ethylbenzene, Naphthalene, and Phenanthrene and reviewed as part of this evaluation. Generic screening levels from the EPA were available for both Ethylbenzene and Naphthalene; however, no screening levels were available for Benzo(g,h,i)perylene or Phenanthrene from EPA. Because no screening levels were available from EPA for these compounds, an industrial soil RSL was calculated using the

EPA's default formulas and exposure parameters. Toxicity data wasn't available for Benzo(g,h,i)perylene or Phenanthrene therefore toxicity data for surrogate compounds were substituted. Specifically, Acenaphthene was used as a surrogate for Benzo(g,h,i)perylene and Anthracene was used as a surrogate for Phenanthrene. For consistency, the surrogate compounds used to calculate the RSLs for these compounds are the same surrogate compounds the PADEP used to develop their medium specific concentrations (MSC). The formulas, input variables, and screening levels [generic and calculated site-specific] are provided below.

1: EPA Industrial Soil RSL Equations [Composite (Indoor/Outdoor) Worker]

Pathway	Non-Carcinogenic Equations
Ingestion	$SL_{w-sol-nc-ing} = \frac{THQ \times AT_W \times ED_W \times BW_W}{EF_W \times ED_W \times \frac{1}{RfD_O} \times IR_W \times CF}$
Dermal	$SL_{w-sol-nc-der} = \frac{THQ \times AT_W \times ED_W \times BW_W}{EF_W \times ED_W \times \frac{1}{RfD_O \times GIABS} \times SA_W \times AF_W \times ABS_d \times CF}$
Inhalation	$SL_{w-sol-nc-inh} = \frac{THQ \times AT_W \times ED_W}{EF_W \times ED_W \times ET_W \times \frac{1}{RfC} \times \left[\frac{1}{VF_S} + \frac{1}{PEF_W}\right]}$
Total	$SL_{w-sol-nc-tot} = \frac{1}{\frac{1}{SL_{w-soil-nc-ing}} + \frac{1}{SL_{w-sol-nc-der}} + \frac{1}{SL_{w-sol-nc-inh}}}$

Note: the compounds requiring a calculated screening level are non-carcinogenic.

2: EPA Industrial Exposure Assumptions *[Composite Worker]*

Variable	Value	Unit
THQ (target hazard quotient)	1	unitless
AT_w (averaging time)	365	d/yr
EF_w (exposure frequency)	250	d/yr
ED_w (exposure duration)	25	yr
ET_w (exposure time)	8	hr/d
BW_w (body weight)	70	kg
IR_w (soil ingestion rate)	100	mg/d
SA_w (surface area)	3300	cm^2
AF_w (skin adherence factor)	0.2	mg/cm^2
CF (conversion factor)	1.00E-06	kg/mg

3: Chemical Specific Inputs

Chemical	RfD_O *mg/kg-d*	RfC *mg/m³*	GIABS *unitless*	ABS_d *unitless*	VF_s *m³/kg*	PEF_w *m³/kg*
Benzo(g,h,i)perylene *(surrogate: Acenaphthene)*	*6.0E-02*	-	*1*	*0.13*	*1.51E+05*	1.36E+09
Phenanthrene *(surrogate: Anthracene)*	*3.0E-01*	-	*1*	*0.13*	6.93E+05	1.36E+09

Italics indicate surrogate values.

4: Applicable Screening Criteria

Chemical	PADEP Non-Residential Soil MSC (mg/kg)		EPA R3 Industrial Soil RSL[3] (mg/kg)
	Unsaturated Soil[1]	Saturated Soil[2]	
Benzo(g,h,i)perylene	180	18	*33,000^*
Ethylbenzene	70	70	27 [270#]
Naphthalene	25	10	18 [180#]
Phenanthrene	10,000	1,000	*170,000^**

[1]Medium Specific Concentration (MSC) for unsaturated, surface or sub-surface soils, used aquifer w/ total dissolved solids less than 2,500 mg/L [HQ=1.0, TR=1.0E-05].
[2]MSC for saturated, surface or sub-surface soils, used aquifer w/ total dissolved solids less than 2,500 mg/L [HQ=1.0, TR=1.0E-05].
[3]EPA Region 3 Regional Screening Level for a composite worker (indoor/outdoor worker) [HQ=1.0, TR=1.0E-06].
^ Value calculated using surrogate toxicity data and the Region 3 equations and exposure assumptions.
# Value adjusted by a factor of 10 (to increase the level of acceptable risk from EPA's default [1.0E-06] to 1.0E-05).
* Calculated value exceeds ceiling limit: value shown is the ceiling limit.

Based on discussions during the meeting with EPA on September 4, 2012, any soil data collected at the Philadelphia and Marcus Hook refineries for these specified compounds will be compared to the calculated industrial soil RSLs. Subsequent to this letter, a letter will be submitted to EPA with each report submittal discussing the data and, as appropriate, comparing the data to these RSLs.

Groundwater

Similar to soil, the generic [non-residential or worker] groundwater screening levels developed by the PADEP, DNREC, and EPA were compiled for Naphthalene and Phenanthrene and reviewed as part of this evaluation. While DNREC and PADEP both have groundwater screening levels published for these compounds, EPA has no published screening level for Phenanthrene and the level for Naphthalene is based on a residential exposure scenario and is not considered applicable to the industrial setting at the Sunoco Refineries. Because the EPA's screening level for Naphthalene was based on a residential scenario and no RSL was available for Phenanthrene an industrial worker RSL was calculated for both compounds using the EPA's default formulas and worker exposure parameters. Toxicity data wasn't available for Phenanthrene therefore toxicity data for a surrogate compound was substituted. Consistent with the approach to develop the soil RSLs, the surrogate compound used to calculate the industrial RSL for Phenanthrene was Anthracene (again, the same surrogate compound used by the PADEP in development of the MSCs for Phenanthrene). The formulas, input variables, and screening levels [generic and calculated site-specific] are provided below.

5: EPA Tap-Water RSL Equations [Adjusted for the Composite Worker]

Pathway	Non-Carcinogenic Equations	Carcinogenic Equations
Ingestion	$SL_{w-wat-nc-ing} = \frac{THQ \times AT_{IW} \times ED_{IW} \times BW_{OW} \times CF_{in}}{EF_{IW} \times ED_{IW} \times \frac{1}{RfD_O} \times IRW_{IW}}$	$SL_{w-wat-nc-ing} = \frac{TR \times AT_{IW} \times LT_{IW} \times CF_{in}}{EF_{IW} \times CSF_o \times IFW_{adj}}$
Dermal	$SL_{w-wat-nc-der} = \frac{DA_{event} \times CF_{der}}{2 \times FA \times K_p \sqrt{\frac{6 \times \tau_{event} \times ET}{\pi}}}$ Where: $DA_{event} = \frac{THQ \times AT_{IW} \times ED_{IW} \times CF_{in} \times BW_{OW}}{\frac{1}{RfD_o \times GIABS} \times EV_{IW} \times ED_{IW} \times EF_{IW} \times SA_{IW}}$	$SL_{w-wat-nc-der} = \frac{DA_{event} \times CF_{der}}{2 \times FA \times K_p \sqrt{\frac{6 \times \tau_{event} \times ET}{\pi}}}$ Where: $DA_{event} = \frac{TR \times AT_{IW} \times LT_{IW} \times CF_{in}}{\frac{CSF_o}{GIABS} \times EF_{IW} \times DFW_{adj}}$ $DFW_{adj} = \frac{EV_{IW} \times ED_{IW} \times SA_{IW}}{BW_{IW}}$
Inhalation	$SL_{w-wat-nc-inh} = \frac{THQ \times AT_{OW} \times ED_{OW} \times CF_{in}}{EF_{IW} \times ED_{OW} \times ET_{WS} \times \frac{1}{RfC} \times K}$	$SL_{w-wat-nc-inh} = \frac{TR \times AT_{OW} \times LT_{IW}}{EF_{IW} \times ED_{OW} \times ET_{WS} \times \frac{1}{24} \times IUR \times K}$
Total	$\frac{1}{\frac{1}{SL_{w-wat-nc-ing}} + \frac{1}{SL_{w-wat-nc-der}} + \frac{1}{SL_{w-wat-nc-inh}}}$	$\frac{1}{\frac{1}{SL_{w-wat-nc-ing}} + \frac{1}{SL_{w-wat-nc-der}} + \frac{1}{SL_{w-wat-nc-inh}}}$

6: EPA Industrial Exposure Assumptions [Composite Worker]

Variable	Value	Unit
ED_{IW} (exposure duration - indoor worker)	25	yrs
TR (target risk)	1.0E-05	unitless
THQ (target hazard quotient)	1	unitless
EF_{IW} (exposure frequency - indoor worker)	250	d/yr
ET_{IW} (exposure time - indoor worker)	8	hr/d
ET_{IW} (exposure time - indoor worker showering)	0.58	hr/event
LT_{IW} (lifetime – indoor worker)	70	yrs
EV_{IW} (events - indoor worker)	1	events/d
BW_{IW} (body weight - indoor worker)	70	kg
SA_{IW} (skin surface area - indoor worker)	18000	cm^2
IRW_{IW} (water intake rate - indoor worker)	1	L/day
K (volatilization factor of Andelman)	0.5	L/m^3
AT_{IW} (averaging time - indoor worker)	365	d/yr
CF_{in} (conversion factor: ingestion/inhalation)	1000	ug/mg
CF_{der} (conversion factor: dermal)	1000	cm^3/L

7: Chemical Specific Inputs

Chemical	RfD_o *mg/kg-d*	CSFo *(mg/kg-d)$^{-1}$*	RFC *mg/m^3*	IUR *ug/m^3*	GIABS *unitless*	K_p *cm/hr*	B *unitless*	τ_{event} *hr/event*	FA *unitless*	DA_{event} *ug/cm^2-event*
Naphthalene	2.0E-02	--	3.0E-03	3.4E-05	1	0.047	0.203	0.549	1	1.14E-01
Phenanthrene *(Sur: Anthracene)*	*3.0E-01*	--	--	--	1	0.144	0.739	1.047	1	1.7E+00

8: Applicable Screening Criteria

Chemical	PADEP Non-Residential GW MSC[1] (ug/l)	EPA R3 Industrial Tapwater RSL[2] (ug/l)	
		Carcinogenic RSL	Non-Carcinogenic RSL
Naphthalene	$100_{Lifetime\ HAL}$	*7.0^C*	*26^NC*
Phenanthrene	$1{,}100_{Cap}$	--	*4,700^*

[1]MSC for used aquifer w/ total dissolved solids less than 2,500 mg/L (HQ=1.0, TR=1.0E-05) [HAL – 2012 EPA Health Advisory Level based on TR=1.0E-04].
[2]EPA Region 3 Tapwater Regional Screening Level for a composite worker (indoor/outdoor worker) [HQ=1.0, TR=1.0E-05].
^ Value calculated using the Region 3 equations, default worker exposure assumptions, and compound specific toxicity data [for Phenanthrene toxicity data for a surrogate compound was substituted].
[C] Carcinogenic screening level (based on inhalation only because the toxicity parameters for the remaining pathways aren't published)
[NC] Non-carcinogenic screening level (based on dermal contact, ingestion, and inhalation)

Based on discussions during the meeting with EPA on September 4, 2012, any groundwater data collected at the Philadelphia and Marcus Hook refineries for these specified compounds will be compared to the calculated industrial RSLs. Two RSLs are provided for Naphthalene: one carcinogenic and one non-carcinogenic. The carcinogenic value is based solely on inhalation because no toxicity data is currently available to assess carcinogenic risks of exposure via ingestion or dermal contact. The non-carcinogenic RSL is based on dermal contact, ingestion, and inhalation. Data for naphthalene will first be screened against the carcinogenic RSL, but any data exceeding the carcinogenic RSL will also be compared to the non-carcinogenic RSL to better understand the potential of risk to exposure. Subsequent to this letter, a letter will be submitted to EPA with each report submittal discussing the data and, as appropriate, comparing the data to these RSLs.

If you have any questions, please feel free to contact me at (610) 833-3444 or jroppenheim@sunocoinc.com.

Sincerely,

James Oppenheim, PE
Sr. Environmental Consultant

cc: Colleen Costello, PG, Langan Engineering
Allison Jelinek, Langan Engineering

Sunoco, Inc.
3144 Passyunk Avenue
Philadelphia, PA 19145-5299
215 339 2000

September 6, 2012

VIA FEDERAL EXPRESS

Mr. Anil Patel
Pennsylvania Department of Environmental Protection
Waste Permitting, SE Regional Office
2 East Main Street
Norristown, PA 19401

Mr. Hon Lee
EPA Project Coordinator (3LC30)
United States Environmental Protection Agency
Region III
1650 Arch Street
Philadelphia, PA 19103-2029

Re: Philadelphia Energy Solutions Refining and Marketing LLC – Sunoco Philadelphia Refinery ***Revised close date for ownership change of Philadelphia Refinery; RCRA Permit PAD049791098***

Dear Mr. Patel and Mr. Lee:

On July 2, 2012, Sunoco, Inc. ("Sunoco") contracted to sell its Philadelphia Refinery (the "Permitted Facility") to Philadelphia Energy Solutions Refining and Marketing LLC ("Philadelphia Energy"). Upon closing, Philadelphia Energy will become the owner of the Permitted Facility.

We previously wrote to notify you of this ownership change of the Permitted Facility. In that previous correspondence, we said that we would notify you if the intended closing date changed.

This letter is to notify you that the closing date for this transaction has changed to Friday, September 7, 2012.

Should you have any questions or need additional information, please contact me at 215-339-2074 or via e-mail at CDBARKSDALE@sunocoinc.com.

Sincerely,

Charles D. Barksdale Jr., PE
Environmental Manager
Philadelphia Refinery

August 6, 2012

VIA FEDERAL EXPRESS

Mr. Anil Patel
Pennsylvania Department of Environmental Protection
Waste Permitting, SE Regional Office
2 East Main Street
Norisstown, PA 19401

Mr. Hon Lee
EPA Project Coordinator (3LC30)
United States Environmental Protection Agency
Region III
1650 Arch Street
Philadelphia, PA 19103-2029

Re: Philadelphia Energy Solutions Refining and Marketing LLC – Sunoco Philadelphia Refinery
Notice of Ownership Change and Intent to Transfer RCRA Permits

Mr. Patel and Mr. Lee:

We are writing to you today to notify you that on July 2, 2012, Sunoco, Inc. ("Sunoco") contracted to sell its Philadelphia Refinery to Philadelphia Energy Solutions Refining and Marketing LLC ("Philadelphia Energy"). The closing is currently scheduled to occur on September 1, 2012. Upon closing, Philadelphia Energy will become the owner and operator of the Philadelphia Refinery. We will provide you with formal notice should the closing date change.

Sunoco, Inc. (R&M) currently holds RCRA Part B and corrective action permits under the following identification numbers: PAD049791098 and PAD002289700. We understand that there is a renewal application pending. Discussions remain ongoing regarding the assignment of permit responsibility between Philadelphia Energy, Sunoco or its affiliates, and your office to determine the correct permit transfer structure and mechanism to best capture the agreement of the parties while allowing Philadelphia Energy to continue operations as they currently exist.

As of the date of transfer, Philadelphia Energy does not anticipate any significant change in operations, equipment, facilities, or union personnel associated with the Philadelphia Refinery. There are, however, various development and modification projects in the planning phase and as those materialize after closing we will contact you for further permitting assistance.

Upon conclusion of the discussions with your office regarding transfer of RCRA liability, we will be submitting the necessary documentation to modify the permits associated with the Philadelphia Refinery that Sunoco or its affiliates currently hold with your agency.

Should you have any questions about this notification or need additional information, please contact Chuck Barksdale at 215-339-2074 or via e-mail at CDBARKSDALE@sunocoinc.com.

Sincerely,

SUNOCO, Inc. (R&M)

By: _____

Name: John D. Pickering

Title: President

PHILADELPHIA ENERGY SOLUTIONS REFINING AND MARKETING LLC

By: _____

Name: Philip L. Rinaldi

Title: Chief Executive Officer

PHILADELPHIA
ENERGY SOLUTIONS

Philadelphia Energy Solutions LLC
1735 Market Street, 10th floor
Philadelphia, PA 19103
215-339-1200

Via Federal Express

October 23, 2012

United States Environmental Protection Agency
Region III
P.O. Box 360515
Pittsburgh, Pennsylvania 15251-6515

Re: In the Matter of Philadelphia Energy Solutions LLC and Philadelphia Energy Solutions Refining & Marketing LLC- Settlement Agreement and Covenant Not to Sue, **Docket No. CERC/RCRA-03-2012-0224DC**

Dear Sir/Madam:

Pursuant to Section IV, Paragraph 22 of the above referenced Settlement Agreement and Covenant Not To Sue, Philadelphia Energy Solutions Refining and Marketing LLC provides the required payment of $100,000. Please contact me at 215-339-2522 with any questions.

Sincerely,

Lisa A. Runyon
Assistant General Counsel

Enclosure

C: Docket Clerk (3RC00)
USEPA Region III
1650 Arch Street
Philadelphia, PA 19103-2029

Chief, Environmental Enforcement Section
Environmental and Natural Resources Division
U.S. Department of Justice
P.O. Box 7611
Ben Franklin Station
Washington, D.C. 20044
Re: DOJ # 90-11-3-10625

Shelia Briggs-Steuteville
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